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EXAMINER

LIGHTFOOT, ELENA TSOY

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/540,721	Applicant(s) GROS ET AL.	
	Examiner ELENA Tsoy LIGHTFOOT	Art Unit 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 March 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 41-96, 107-111 and 114-117 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 41-96, 107-111 and 114-117 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on March 16, 2010 has been entered.

Response to Amendment

Amendment filed on March 16, 2010 has been entered. Claims 112-113 have been cancelled. New claims 116-117 have been added. Claims 41-96, 107-111 and 114-117 are pending in the application.

Claims examined on the merits are 41-96, 107-111 and 114-117.

Specification

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
- (f) BACKGROUND OF THE INVENTION.

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- (1) Field of the Invention.
- (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

Claim Objections

1. Objection to claims 114-115 because of the informalities has been withdrawn due to amendment.
2. Claim 79 is objected to because of the following informalities: "from 30 to 95°C 95°C" should be changed to "from 30 to 95°C 95°C". Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.
4. Rejection of claims 41-96, 107-111, 114 and 115 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement has been withdrawn due to amendment.
5. Rejection of claims 41-96, 107-111, 114 and 115 under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for 20-220 m per minute,

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does not reasonably provide enablement for 220 m per second has been withdrawn due to amendment.

6. Rejection of claims 41-96, 107-111, 114 and 115 under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement because the Applicants' specification provides no guidance how to select suitable monomers, oligomers and/or polymers such that a narrow distribution of medium-sized chain lengths results when the components are cross-linked, has been withdrawn due to amendment.

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Rejection of claims 41, 43, 45, 47, 49, 50, 52, 54, 56, 58, 60, 62, 63, 65, 67, 69, 71, 73, 75, 77, 79, 81, 83, 85, 87, 89, 91, 93, 95, 107-111, 114 and 115 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention has been withdrawn due to amendment.

9. Claims 43, 44, 47-49, 65, 66, 85, 86 and 114-117 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 43, 44, 47-49, 85, 86 recite limitation "at least partially anionically, cationically or/and radically curable" which contradicts limitation of claims 41-42 "at least partially anionically, cationically or radically curable". For examining purposes the

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limitation was interpreted as “at least partially anionically, cationically ~~or~~and radically curable”.

Language of claims 65-66 is confusing because a sentence starting with a second “wherein” lacks a verb. For examining purposes the claims were interpreted as “wherein at least one additive is added to the anticorrosive composition, ~~wherein~~ selected from the group consisting of at least one wetting agent, defoaming agent, lubricant, bonding agent, pigments, flow control agents, agents to increase reactivity, surface additives to increase scratch resistance ~~or~~ and auxiliary agents.”

Claims 114 and 115 recite: “The process of claim 41, wherein the composition includes 24 to 33 wt. % of urethane acrylate polyester as the base polymer component”, which is confusing because “a base polymer component” is not recited in claims 41. There is insufficient antecedent basis for this limitation in the claims. For examining purposes the phrase was interpreted as “The process of claim 41, wherein the composition includes 24 to 33 wt.% of urethane acrylate polyester as the base polymer component”.

Claims 116 and 117 recite: “wherein 30 to 44 wt. % of the monofunctional monomer or oligomer is a mixture of isobornylacrylate and isobornylmethacrylate”, which is confusing because isobornylacrylate and isobornylmethacrylate are monomers not oligomers”. For examining purposes the phrase was interpreted as “wherein 30 to 44 wt. % of the monofunctional monomer ~~or oligomer~~ is a mixture of isobornylacrylate and isobornylmethacrylate”.

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Double Patenting

10. A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

11. Applicant is advised that should claims 110-111 be found allowable, claims 116-117 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof.

When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 41-96, and 107-109 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gros (DE 19925631A) in view of Koegler et al (US 5916979).

Examiner Note: for convenience, instead of DE 19925631A in German, the Examiner will refer to US 20050186442 of the same patent family.

Gros discloses a method of applying a weldable anticorrosive coating to a metallic substrate (See Abstract) in the form of a strip (See P29) comprising applying to a metallic substrate a mixture comprising 15 to 60 wt % a polymeric organic binder (See P23); 20 to 60 wt % (See P24) of a low-molecular liquid compound such as dipropylene and tripropylene glycol di(meth)acrylate, 2-acetoacetyloxy ethyl methacrylate, hexanediol diacrylate, **hydroxy**propyl methacrylate, **hydroxy**ethyl methacrylate, trimethylolpropane triacrylate (See P17), 5 to 30 wt % photoinitiator (See P25), and 0.1 to 5 wt % additives (See P27) such as polysiloxanes, silanes and silicon-free oligomeric or polymeric surfactants, adhesion promoters, soluble *corrosion inhibitors*, dyes and **color pigments** (See P20), curing the coated strip by UV light sources, which have emission maxima in the spectral range from about 100 to 700 nm, at ambient temperatures, which do not lie much above room temperature, and then post curing by passing through a drying oven, which has a temperature up to about 250⁰C to increase the corrosion resistance (See P30) to provide a corrosion- and solvent-resistant slidable weldable coating which can be **deformed** together with the substrate without being damaged (See P10). The viscosity should lie in a range which allows a uniform application to form a thin layer having a thickness of about **2 to 8 μ** (claimed wet and dry thickness) (See P28, 29). In any case, the layer composition and the **curing conditions** should be chosen such that a hard, firm, corrosion-resistant layer is obtained, which is, however, sufficiently tough, so that a *deformation* of the substrate, for instance of the steel sheet, is ensured without brittle cracks in the anticorrosive layer (See P31). The

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processing of the anticorrosive layer by the inventive method provides for a wide variation of the layer thickness within the range indicated above (See P32).

As to claimed concentration limitations, it is well settled that overlapping ranges are prima facie evidence of obviousness. Therefore, it would have been obvious to one having ordinary skill in the art to have selected the portion of Stevenson's range that corresponds to the claimed range. Moreover, it is held that concentration limitations are obvious absent a showing of criticality. *Akzo v. E.I. du Pont de Nemours* 1 USPQ 2d 1704 (Fed. Cir. 1987).

As to strip velocities, Gros teaches that the metallic substrate to be coated preferably is a *steel strip* which is *zinc-coated* (See P29). Gros fails to teach that metallic strips are coated at strip velocities up to 220 m per minute.

Koegler et al teaches that coating materials, which can be processed in liquid form at room temperature, may be applied to strips (steel, zinc-plated steel, aluminum, etc.) on **typical** high-performance units in the coil-coating industry at high belt speeds (up to **200 m/min**) and ensures highly uniform application of the coating (See column 1, lines 20-28). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a *typical* high-performance unit in the coil-coating industry for coating a metal strip in Gros with the expectation of providing the desired high belt speeds of up to 200 m/min and highly uniform application of the coating, as taught by Koegler et al.

As to claimed chemical resistance, it is the Examiner's position that a process of Gross in view of Koegler et al would provide coating having claimed chemical

resistance, since the process of Gross in view of Koegler et al would be substantially identical to that of claimed invention.

As to claims 50-55, Gros teaches that suitable binders include condensation resins, epoxy resins, poly(meth)acrylates, **polyurethanes**, **polyesters**, polyethers and esterification products thereof **with acrylic or methacrylic acid** (See P16).

As to claims 56-57, Gros teaches that photoinitiators include quinones, *ketones* and the *ketals* thereof, for example benzildimethylketal, benzoin, substituted benzoin and *benzoin ethers*, *.alpha.-amino ketones*; furthermore polynuclear heterocyclic compounds such as acridines, phenazines and the substitution products thereof as well as substituted *phosphine oxides*, for instance bisacyl phosphine oxides (See P18).

As to claim 62, Gros teaches that another important component are inorganic pigments, in particular anticorrosive or antirust pigments, for instance oxides, phosphides or phosphates of iron or aluminum, and other conductive pigments, for instance graphite-mica pigments (See P21).

As to claims 71-72, Gros teaches that the viscosity can be adjusted by choosing the kind and quantity above all of the binder and of the polymerizable compound. In general, it lies in the range from 1000 to 10000 mPas (See P28).

As to claims 73-76, Gros teaches that coating can be effected by spraying, by means of slot nozzles or by means of rollers (See P29).

As to claims 77-78, Gros teaches that the metallic substrate to be coated preferably is a strip or sheet which mostly consists of steel (See P29).

As to claims 79-80, Gros teaches that the inventive coating mixture *preferably* is free of inert volatile solvents, in particular organic solvents or water (See P14).

Obviously, solvent may be used in nonpreferred embodiments as in prior art. If used, it is dried before applying the coating (See P7). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have determined the optimum values of the relevant drying temperature parameters (including those of claimed invention) in Gros depending on particular application.

As to claims 87-88, Gros teaches that the layer adheres to the substrate firmly and durably; it can be *overpainted* as usual, for instance by cationic dip-coating, and has a smooth, slidable surface (See P32).

As to claims 91-92, Gros teaches that in the main field of application of the inventive method, the production and processing of body sheets for the automotive industry, the inventive coating of the sheets (coils) is advantageously effected at the sheet manufacturer after the pre-treatment. The sheets are then protected against corrosion ("coil-coated steel") and in this stage can be transported to the finisher, in general to the car manufacturer, and be stored. They are ***deformed as desired*** and subjected to a usual dip-coating as *priming*. To this prime coat, a **finishing paint** will then be applied at a later date. In general, the prime coat cannot reach all parts of the deformed steel sheet. Due to the inventive coating, the surface still remains protected against corrosion despite deforming and welding. (See P33).

As to claims 93-94, Gros teaches that the mixture was applied to a **degreased** and dried sheet of electrolytically zinc-coated and chromitized steel (See P36).

As to claims 95-96, although Gros does not teach carrying a metal strip on a conveyor belt, it is the Examiner's position that the limitation would be obvious to one of ordinary skill in the art.

As to claims 58-59, 85-86, Gros teaches that suitable binders include **epoxy resins** (See P16) which are known to be cured by melamine (See P4). Gros also teaches that the corrosion resistance of UV-cured coating can still be increased with an additional postcure by a subsequent brief passage through a drying oven, which has a temperature up to about 250⁰C and the surface temperature of the strip can reach about 150 to 160⁰C with a dwell time of 30 seconds (See P30).

As to claims 108-109, Gros teaches Zn-coated steel (See P29, 36).

14. Claims 41-57, 63-66, 71-78, 81-84, 87-90, 93, 94, 108-111 and 114-117 are rejected under 35 U.S.C. 103(a) as being unpatentable over Emmons (US 4180598) in view of Koegler et al '979.

Emmons discloses a process for coating a metallic surface of a metallic substrate such as aluminum, steel, copper, zinc, etc, comprising applying a radically curable coating composition to impart *improved adhesion* of the cured coating to bare metals (See Abstract). 0.5% to 25% by weight β -acryloxypropionic acid (AOPA) (**claimed first organic corrosion inhibitor**) is added to the composition as part of the reactive diluent in the radiation curable composition (See column 2, lines 49-60). Preferred radiation-curable coating compositions to which the AOPA is added are 100% solids compositions comprising (See column 5, lines 22-27): (a) 10-90 wt. % of one or **more** ethylenically unsaturated **monomers** having at least one terminally unsaturated group

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of the formula $H_2C=C<$ (See column 5, lines 22-), and (b) 10-90 wt. % of at least one vinyl addition **oligomer** having MW 600 to about 20,000 (See column 5, lines 31-43), 0.1-5 wt. % a photosensitizer or **photoinitiator** (See column 5, lines 16-17), and optionally 0.1-5 wt. % (See column 5, lines 17-20) an amine activator (See column 2, line 61 to column 3, line 9).

As to claimed concentration limitations, it is well settled that overlapping ranges are prima facie evidence of obviousness. Therefore, it would have been obvious to one having ordinary skill in the art to have selected the portion of Emmons's range that corresponds to the claimed range. Moreover, it is held that concentration limitations are obvious absent a showing of criticality. *Akzo v. E.I. du Pont de Nemours* 1 USPQ 2d 1704 (Fed. Cir. 1987).

As to claimed thickness, Emmons teaches that the coating composition may be applied to about 1.5 mil of wet thickness ($1.5 \times 25.4 = 38.1$ microns) (See column 7, lines 52-53). Obviously, coating thickness would depend on particular coating composition and on particular use of a coated metal. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have determined the optimum values of the relevant thickness parameters (including those of claimed invention) in Emmons through routine experimentation in the absence of showing of criticality.

As to metal substrate coating velocities, Emmons fails to teach that metallic substrates are coated continuously. However, it is well settled that it is within the level of ordinary skill to operate a process continuously. *In re Dilnot* 138 USPQ 248 (CCPA 1963); *In re Korpi* 73 USPQ 229 (CCPA 1947); *In re Lincoln* 53 USPQ 40 (CCPA 1942).

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Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have carried out coating process in Emmons continuously with the expectation of providing the coated metal substrates with desired improved adhesion.

Emmons fails to teach that metallic substrates are coated at velocities up to 220 m per minute.

Koegler et al teaches that coating materials, which can be processed in liquid form at room temperature, may be applied to strips (steel, zinc-plated steel, aluminum, etc.) on *typical* high-performance units in the coil-coating industry at high belt speeds (up to **200 m/min**) and ensures highly uniform application of the coating (See column 1, lines 20-28). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a *typical* high-performance unit in the coil-coating industry for coating a metal strip in Emmons with the expectation of providing the desired high belt speeds of up to 200 m/min and highly uniform application of the coating, as taught by Koegler et al.

As to claimed chemical resistance, it is the Examiner's position that a process of Emmons in view of Koegler et al would provide coating having claimed chemical resistance, since the process of Emmons in view of Koegler et al would be substantially identical to that of claimed invention.

As to claims 49, 110-111, 116-117, Emmons teaches that the ethylenically unsaturated monomers include *acrylic or methacrylic* acid esters, such as **isobornyl acrylate** (See column 3, lines 10-13). In other words, at least one monomers in the

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coating composition may include isobornyl acrylate or isobornyl **meth**acrylate. It is well settled that it is prima facie obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition which is to be used for the very same purpose. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a mixture of isobornyl acrylate and isobornyl methacrylate as at least one monomers in the coating composition of Emmons with the expectation of providing the desired coating with improved adhesion to bare metals.

As to claims 50-55, 114-115, Emmons teaches that suitable binders include condensation resins, epoxy resins, poly(meth)acrylates, **polyurethanes**, **polyesters**, polyethers having at least two **acryloxy**-capped groups (See column 3, line 32 to column 4, line 69), **polymethacrylate urethane** esters (See column 4, lines 26-27).

As to claims 56-57, Emmons teaches that photoinitiators include benzoin alkyl ethers, desyl halides, desyl amine, benzophenone derivatives, acetophenone compounds, polychlorinated aromatic compounds, combination of organic carbonyls and amines or mixtures thereof (See column 5, lines 3-11).

15. Claims 41-66, 69-92, 95-96, and 107-109 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stevenson et al (US 6087417) in view of Koegler et al '979.

Stevenson et al discloses a process comprising applying to a metal substrate such as galvanized steel or *aluminum* in the form of sheets, or **coils** (See column 10, lines 36-44) with solvent-free curable coating composition which include (A) 65-95 wt % (See column 9, lines 33-34) of a reaction product of epoxy resin, acid, and tertiary

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amine (claimed radically curable polymer); (B) 5-35 wt % (See column 9, lines 35-36) of reactive diluent, (C) curing agent (See Abstract) and a *photoinitiator* (See column 8, lines 37-38); and curing the coated metal substrate using a two stage process--(i) an *initial radiation* such as UV radiation (See column 10, lines 60-61) causing any unsaturated groups in the coating composition polymerize, i.e., the acrylate groups contained in the quaternary salts (See column 11, lines 5-8), any *unsaturated carboxylic acids* (claimed first organic corrosion inhibitor and coupling polymer) and any unsaturated diluents, to form a polymerized coated substrate (See column 2, lines 42-49); and (ii) heating the resulting UV polymerized coated substrate at about 400⁰F (204⁰C) or above to decompose the quaternary ammonium salt groups (claimed first organic corrosion inhibitor) and to provide the **desired adhesion** of the coating to the substrate (See column 11, lines 8-12). The reactive diluent (B) includes acrylated and methacrylated compounds of molecular weight of 250 to 1000, i.e. claimed radically curable monofunctional acrylate and methacrylate monomers and/or oligomers (See column 7, lines 42-55). The method is especially useful for making can ends and can bodies where a high degree of **flexibility and corrosion resistance** (claimed anticorrosive composition) is needed (See column 11, lines 27-30). The coating that is more **flexible** while remaining impervious and will undergo further **post cure fabrication** by employing at least about 50 wt. % and preferably at least about 90% polyoxyalkylene glycol monoacrylate ester as the reactive diluent the cured coating is, a coating which is generally desired (See column 7, lines 58-65).

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As to claimed coating thickness, Stevenson et al teaches that the method for forming cured coated substrates is useful for the interior and exterior coating of metal containers that will come in contact with food or beverages. The method is especially useful for making can ends and can bodies where **a high degree of flexibility and corrosion resistance** is needed (See column 11, lines 25-30). Additionally, this invention can be used as a **side seam** coating for the interior of food and/or beverage cans. Side seam coating are generally applied as **thick** films and require blister resistant coatings (See column 11, lines 30-33). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have determined the optimum values of the relevant thickness parameters (including those of claimed invention) in Stevenson et al through routine experimentation depending on particular application in the absence of showing of criticality.

As to claimed concentration limitations, it is well settled that overlapping ranges are prima facie evidence of obviousness. Therefore, it would have been obvious to one having ordinary skill in the art to have selected the portion of Stevenson's range that corresponds to the claimed range. Moreover, it is held that concentration limitations are obvious absent a showing of criticality. *Akzo v. E.I. du Pont de Nemours* 1 USPQ 2d 1704 (Fed. Cir. 1987).

As to strip velocities, Stevenson et al teaches applying solvent-free curable coating composition to a metal substrate such as *galvanized* steel in the form of **coils** (See column 10, lines 36-44).

Stevenson et al fails to teach that metallic coils are coated at strip velocities up to 220 m per minute.

Koegler et al teaches that coating materials, which can be processed in liquid form at room temperature, may be applied to strips (steel, zinc-plated steel, aluminum, etc.) on **typical** high-performance units in the coil-coating industry at high belt speeds (up to **200 m/min**) and ensures highly uniform application of the coating (See column 1, lines 20-28). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a *typical* high-performance unit in the coil-coating industry for coating a metal strip in Stevenson et al with the expectation of providing the desired high belt speeds of up to 200 m/min and highly uniform application of the coating, as taught by Koegler et al.

As to claimed properties, it is the Examiner's position that a composition of Stevenson et al would provide a narrow distribution of medium-sized chain lengths when the components are cross-linked and would have claimed properties, as required by Claims 41 and 42 inherently since the process of Stevenson et al would be substantially identical to that of claimed invention.

As to claims 43-48, 50-51, the reactive diluent comprises a *polyester* acrylate or methacrylate (See column 7, lines 48-49).

As to claim 49, ethylenically unsaturated reactive diluents are the mono and **diesters** of polyoxyalkylene ethers such as polyethers prepared from **ethylene** and *propylene* oxide. Suitable diluents include polyalkylene glycol mono-(meth)acrylates,

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polyalkylene glycol di(meth)acrylates (i.e. include claimed diethylene glycol diacrylate or claimed dipropylene glycol diacrylate) (See column 7, lines 42-47).

As to claims 50-51, (meth)acrylic mono- and diesters of a number of polyether compounds are available commercially and can be used to good effect to *modify the crosslink density* and glass transition temperature of the cured epoxy-vinyl polymer coated substrates (See column 7, lines 36-40). Where the coating is to be applied to a metal substrate which will undergo further post cure fabrication, a **coating which is more flexible while remaining impervious** is generally desired (See column 7, lines 57-62). This can be achieved by employing versions of the present coating compositions which include at least about 50 wt. % polyoxyalkylene glycol monoacrylate ester as the reactive diluent (claimed additional flexibilizing resin) (See column 7, lines 62-65).

As to claims 56-57, *any of the commonly used photoinitiators may be used*. Among these the combination of *benzophenone* and a tertiary amine are examples of suitable initiators for use with the water-based coatings described herein. Initiator levels may vary from 1 to 5 wt. % depending on the oxygen content of the atmosphere over the coating, the coating viscosity at the point of cure, the line speed, and the number and intensity of the ultraviolet lights employed.

(See column 8, lines 37-48).

As to claims 58-59, the curable coating composition includes curing agents, such as **aminoplast** resins (claimed melamine resin), phenoplast resins, or mixtures thereof

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(claimed hardener for a chemical postcure), depending on the amount of saturated acid or hydroxyl bearing diluent employed (See column 8, lines 24-25).

As to claim 62, "further corrosion inhibitor" limitation is *optional* and, thus, is not addressed here.

As to claims 65-66, surfactants (claimed wetting agent) and other coating *additives*, as well known in the art can also be added to the coating composition (See column 8, lines 66+).

As to claims 69-70, pigments, dyes or other coloring agents may be included to achieve desired visual effects (claimed colored pigment) (See column 12, lines 7-10).

As to claims 71-72, aqueous versions of the present curable coating composition typically include at least about 25 wt. % of a coating solids component and about 50 to about 75 wt. % water. Preferably, the aqueous coating compositions have a coating solids content of about 25 to about 40 wt. % and a #4 Ford cup viscosity (at 25.degree. C.) of about 15 to about 75 seconds (See column 9, lines 7-12). It is well known in the art that for different techniques different viscosities are required. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have determined the optimum values of the relevant viscosity parameters (including those of claimed invention) in Stevenson et al depending on particular applying technique used.

As to claims 73-76, the liquid coating formulation is applied by bar coater or roller coater at room temperature (See column 16, lines 10-12). The solvent-free composition can be applied to the substrate as liquid (at room temperature) (See column 8, lines 11-

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15) by a variety of techniques and equipment, including: heated multi-**roller** application equipment; slotted nozzles or blades; **spray** guns, or other similar equipment (See column 2, lines 32-35; column 10, lines 7-13).

As to claims 77-78, the compositions can be used to form coatings on surfaces of articles made of steel and aluminum and its alloys (See column 10, lines 43-44).

As to claims 79-80, if desired, the coated substrate can be dried prior to polymerization and heating. During the optional drying step, the coated substrate is typically briefly pre-baked to remove any water or solvent using either a infrared drying unit, a conventional oven, or forced hot air. (See column 10, lines 45-48). Obviously, drying temperature would depend on particular composition, thickness, etc. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have determined the optimum values of the relevant drying temperature parameters (including those of claimed invention) in Stevenson et al depending on particular application.

As to claims 91-92, Stevenson et al teaches that after forming the cured coated substrate, the substrate is cooled to a temperature where it may be further handled and **processed as desired without damaging** the cured coating layer (See column 11, lines 15-24).

As to claims 95-96, Stevenson et al teaches carrying a metal strip on a conveyor belt (See column 16, lines 15-19).

As to claims 108-109, it is well known in the art that steel is typically galvanized with zinc.*

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16. Claims 58-59 and 85-86 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gros '631 in view of Koegler et al '979 or over Emmons '598 in view of Koegler et al '979, as applied above, and further in view of Kogure et al (US 5196487).

Gros also teaches that the corrosion resistance of UV-cured coating can still be increased with an additional postcure by a subsequent brief passage through a drying oven, which has a temperature up to about 250⁰C and the surface temperature of the strip can reach about 150 to 160⁰C with a dwell time of 30 seconds (See P30).

Kogure et al teaches that a photopolymerizable composition which gives high corrosion resistance to metals, such as iron, zinc, copper and aluminum, may be used singly or in combination with a crosslinking agent (See column 12, lines 34-43). In the case where the coating cured with light contains a crosslinking agent which undergoes a crosslinking reaction with the functional group, such as **hydroxyl**, in the resin, heating of the coating, for example, at about 80⁰C to about 180⁰C for 10 to 60 minutes, gives an increased crosslinking density and improved strength to the coating (See column 12, lines 24-30). When the resin in a coating composition contains **hydroxyl** as a functional group, the crosslinking agent such as a *polyisocyanate* compound, blocked polyisocyanate compound, amino resin, i.e., a condensation product of urea, **melamine**, is used for the agent to cause crosslinking at room temperature or with heating, in addition to photopolymerization due to the polymerizable double bond (See column 11, lines 41-63).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a coating composition containing a hydroxyl functional binder in combination with a crosslinking agent such as a polyisocyanate compound, blocked polyisocyanate compound or melamine in Gros instead of using it singly with the expectation of providing the desired increased crosslinking density and improved strength to the coating, as taught by Kogure et al.

17. Claims 58-59 and 85-86 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gros '631 in view of Koegler et al '979 or over Emmons '598 in view of Koegler et al '979, as applied above, and further in view of Stevenson et al '417.

Stevenson et al teaches that the curable coating composition may include curing agents, such as **aminoplast** resins (claimed melamine resin) (claimed hardener for a chemical postcure), depending on the amount of saturated acid or hydroxyl bearing diluent employed (See column 8, lines 24-25).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have carried out postcure a coating composition containing a hydroxyl functional binder with addition of aminoplast resins in Gros with the expectation of providing the desired postcure, as taught by Stevenson et al.

18. Claims 67-68, 87-88, and 93-94 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stevenson et al '417 in view of Koegler et al '979 or over Emmons '598 in view of Koegler et al '979, as applied above, further in view of Shustack (US 5,128,387).

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As to claims 67-68, Stevenson et al discloses that surfactants (claimed wetting agent) and other coating *additives*, as well known in the art can also be added to the coating composition (See column 8, lines 66+).

Each of Stevenson et al and Emmons fails to teach that the additives include a lubricant.

Shustack teaches that a polyethylene wax additive or a fluorinated hydrocarbon such as polytetrafluoroethylene (Teflon) may be optionally added to a composition to increases slip and abrasion resistance (See column 9, lines 31-34, column 9, lines 60-68).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a polyethylene wax and/or Teflon as additives in the cited prior art with the expectation of providing the desired increased slip and abrasion resistance, as taught by Shustack.

As to claims 87-88, Shustack teaches that the coating may be a single pigmented layer or the pigmented layer may be overcoated with a clear layer. Generally, overcoating with a clear layer is the preferred approach, using a single pass through curing radiation equipment for curing and hardening both layers at the same time. Alternatively, though less preferably, the pigmented layer may be cured before applying the overcoat. See column 3, lines 25-33.

As to claims 93-94, Stevenson et al teaches that the substrate may optionally be subjected to any desired preparation or treatment steps before application of the coating composition. Examples of such treatments include cleaning, corona treatments, flame

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treatment, and application of *primers*, adhesives or other layers (See column 12, lines 14-17). Each of Stevenson et al and Emmons fails to teach cleaning and/or pickling the metallic substrate before application of the primer. However, Shustack teaches that in the production of e.g. beverage cans, such as aluminum beer cans, a can cup is formed from a sheet of aluminum of desired thickness, then washed with alkaline and acid baths and dried before coating (See column 3, lines 6-16). The can cup can be washed by passing through a series of *alkaline and acid baths*. Between each bath the can cup is rinsed with fresh water, and the final rinse is with deionized water. See column 13, lines 30-37.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have pickled and rinsed the metallic substrate before application of the primer in the cited prior art.

19. Claims 110-111 and 116-117 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gros '631 in view of Kogler et al '979 or over Stevenson et al '417 in view of Kogler et al '979, as applied above, and further in view of Shustack '387.

Each of Gros and Stevenson et al fails to teach that the low-molecular liquid compound includes 30-44 wt % of a mixture of isobornyl acrylate and isobornyl methacrylate. However, Shustack teaches that the presence of 15-75 wt % of a bulky monomer such as isobornyl acrylate and isobornyl methacrylate (See column 5, lines 21-31) in a metal coating composition is thought to confer the desirable property of ductility on the composition (See column 5, lines 47-62). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have

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used isobornyl acrylate or isobornyl methacrylate as low-molecular liquid compound in coating composition of Gros/Stevenson et al with the expectation of providing the coating composition with the desired ductility, as taught by Shustack.

It is well settled that it is prima facie obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition which is to be used for the very same purpose. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used isobornyl acrylate and isobornyl methacrylate as low-molecular liquid compound in coating composition of Gros/Stevenson et al with the expectation of providing the coating composition with the desired ductility, as taught by Shustack.

The 15-75 wt % range of Shustack overlaps claimed range of 30-44 wt %. It is well settled that overlapping ranges are prima facie evidence of obviousness. It would have been obvious to one having ordinary skill in the art to have selected the portion of Shustack's range that corresponds to the claimed range.

20. Claims 110-111 and 116-117 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gros '631 in view of Kogler et al '979 or over Stevenson et al '417 in view of Kogler et al '979, as applied above, and further in view of Emmons '598.

Each of Gros and Stevenson et al fails to teach that the low-molecular liquid compound includes 30-44 wt % of a mixture of isobornyl acrylate and isobornyl methacrylate. However, Emmons teaches that teaches that *acrylic or methacrylic* acid esters, such as **isobornyl acrylate** (See column 3, lines 10-13) may be used as monomers in anticorrosive coating composition for coating bare metals (See Abstract).

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It is well settled that it is prima facie obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition which is to be used for the very same purpose. It is also held that the selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). See MPEP 2144.07.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a mixture of isobornyl acrylate and isobornyl methacrylate in the cited prior art with the expectation of providing the desired anticorrosive coating since Emmons teaches that teaches that *acrylic or methacrylic* acid esters, such as **isobornyl acrylate** are suitable for the use as monomers in anticorrosive coating composition for coating bare metals

21. Claims 114-115 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gros '631 in view of Kogler et al '979, as applied above, and further in view of Anderson et al (US 6,413,590) (See column 2, lines 24-30) and Field et al (US 3,658,943).

Gros teaches that suitable binders include *polyurethanes, polyesters, polyethers* and other similar polymers or polymers derived therefrom and esterification products thereof with acrylic or methacrylic acid (See P16), i.e. **polyurethane acrylate, polyester acrylate** and polyether acrylate . It is well settled that it is prima facie obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition which is to be used for the very

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same purpose. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a mixture of polyurethane acrylate and polyester acrylate as a binder in Gros because each of them is suitable as a binder.

Gros fails to teach that polyester urethane acrylate is used as a binder.

Anderson et al (See column 2, lines 24-30) and Field et al (See column 4, lines 3-5) teach that a random or graft copolymer is functionally equivalent to a mixture of homopolymers. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used acrylated copolymer of polyurethane and polyester (polyester urethane acrylate) as a binder in Gros instead of a mixture of polyurethane acrylate and polyester acrylate with the expectation of providing the same desired benefits since Anderson et al and Field et al teach that properties of a polymer composition depend basically on polymer units themselves, not on how they are combined.

Response to Arguments

Applicant's arguments filed March 16, 2010 have been fully considered but they are not persuasive.

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(A) Applicants traverse each of these rejections. Koebler only relates to thick-layer coating of metallic substrates (col. 1, lines 10-11). Furthermore, Applicants reiterate that Gros concerns radically curable compositions with certain types of electroconductive particles. Examples 1 to 3, 5 and 6 show a content of aliphatic urethane acrylate, but the selection of reactive diluents ("polymerizable compounds") does not provide any hint or suggestion to select isobornylacrylate, isobornylmethacrylate, but to other acrylates/diacrylates/triacrylates as mentioned in the examples of the present application. The base polymer is called a "binder" which is disclosed in pars. [0016] and [0023]. In the examples, novolak epoxy resin, acrylic ester of an. aromatic epoxy resin and perhaps aliphatic urethane acrylate are mentioned• as base polymer.

The Examiner respectfully disagrees with this argument. If Koebler et al can apply thick-layer coating to metallic substrates at high belt speeds (up to **200 m/min**), one of ordinary skill in the art would have reasonable expectation of success in applying thinner coating to metallic substrates at the same speed.

As to Gros, First of all, claims 41, 42, 108 and 109 are open ended so that they do not limit radically curable compositions to any types of electroconductive particles or monomers or oligomers. Second, it is well settled that patents are relevant as prior art for all they contain including prior art's broad disclosure. See MPEP 2123. **Disclosed examples** and preferred embodiments **do not constitute a teaching away from a broader disclosure or nonpreferred embodiments**. See MPEP 2123. Therefore, the Examples including 1 to 3, 5 and 6 showing a content of aliphatic urethane acrylate, but not isobornylacrylate, isobornylmethacrylate, do not constitute a teaching away from a broader disclosure of Gros.

(B) Applicants submit that Stevenson protects curable coating compositions comprising a coating solids component which includes: A) at least 30 %w of quarternized reaction product from epoxy resin and acid/tertiary amine including ammonium salts, B) at least 5 %w of reactive diluent (Claim 1; col. 7/8, e.g. polyester acrylates) and optionally curing agent. The compositions of this reference may be free of organic solvents, as the reactive diluents work as such solvents, but are then able to chemically react to form binder phase. There may be up to 30 %w of organic solvent and up to 60-70 %w of water nevertheless (bottom of col. 4). In col. 10, I. 36 and 40 flat sheet and coil are mentioned, but not arty corrosion resistant agents like organic or inorganic corrosion inhibitors or corrosion resistant silicate pigments.

The Examiner respectfully disagrees with this argument. First of all, the Applicants' specification as originally filed does not provide definition of an organic corrosion inhibitor. Second, the Applicants' specification discloses: "In the process according to the invention at least one first organic corrosion inhibitor can preferably be added to the anticorrosive composition, selected from the group of compounds based on amines, derivatives of an **organic acid** such as e.g. dicarboxylic acid derivatives, thiols and conductive polymers, in particular based on succinic acid derivatives, ethyl morpholine derivatives, polyamine fatty acid derivatives or/and triazole derivatives (See P80 of Published Application). Therefore, in contrast to Applicants assertion, **organic acid** and the quarternized reaction product from epoxy resin and acid/tertiary amine including ammonium salts that provide the **desired adhesion** of the coating to the substrate, of Stevenson read on claimed first organic corrosion inhibitor.

(C) Applicants submit that Stevenson does not specifically disclose to add urethane acrylate polyester or isobornylacrylate or isobornylmethacrylate. All these cited publications mentioned above do disclose the different compositions and sometimes chemical reactions for the production of a binder, but nowhere is data provided for corrosion resistance and paint adherence. Therefore, a comparison by coating properties is impossible. The present application discloses a combination of binder generating substances from urethane acrylates with reactive diluents like isobornylacrylate and isobornylmethacrylate. None of the cited references discloses the coating of metallic strips at the claimed Velocity. Thus, all rejections should be withdrawn. Allowance is respectfully requested.

The Examiner respectfully disagrees with this argument. All these features were rejected over Stevenson in combination with other references. It is well settled that one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ELENA Tsoy LIGHTFOOT whose telephone number is

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(571)272-1429. The examiner can normally be reached on Monday-Friday, 9:00AM - 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Elena Tsoy Lightfoot, Ph.D.
Primary Examiner
Art Unit 1792

March 25, 2010

/Elena Tsoy Lightfoot/